

Abstract: PB3134

Title: VERIFICATION OF STEM CELL COUNT IN FRESH AND OVERNIGHT STORED PERIPHERAL BLOOD STEM CELLS.

Abstract Type: Publication Only

Topic: Stem cell transplantation - Clinical

Background:

Autologous stem cell transplant with peripheral blood stem cells (PBSC) is done for haematological and non-haematological malignancies. In Sabah, autologous stem cell transplants are done in Hospital Queen Elizabeth I (HQE I). The stem cell laboratory in Women & Children Hospital Sabah (WCH) handles the stem cell enumeration and processing for these adult patients. At times, the stem cell harvest (post-apheresis) will arrive to the laboratory at late business hours. During these times, the stem cell (viable CD34 cell) dose will be enumerated from the fresh harvest and the sample will be kept overnight in the blood fridge (2-6°C) for processing the next morning. This is based on the National Stem Cell Transplant 2018 guideline which recommends storage at 2-6°C and further processing within 72 hours of collection. When processing the product next morning, the viable CD34 cell count will be again enumerated before proceeding for plasma depletion and subsequently cryopreservation. Culture and sensitivity (C&S) tests will also be done on the fresh and overnight stored sample.

Aims:

To verify that no significant drop of stem cell count (viable CD34 cell count) in overnight stored PBSC.

Methods:

This is a retrospective cohort study done from July 2022 till July 2023. 18 PBSC samples from HQE I adult patients were included in this study. These patients were planned for autologous stem cell transplants for haematological malignancies. Bone marrow samples and paediatric samples were excluded. The viable CD34 dose, TNC (Total nucleated cell) dose, CD34 viability % were calculated and compared with paired t-test for both fresh and overnight stored samples. The viable CD34 cell count, TNC count were enumerated with flowcytometry analyzer FACS CANTO II.

Results:

Predominantly, the patients were male (67%), age ranges from 20-54 years with underlying haematological malignancies such as multiple myeloma (33%), Hodgkin lymphoma (28%), diffuse large B- cell lymphoma (11%), mantle cell lymphoma, composite lymphoma, peripheral T-cell lymphoma, acute promyelocytic leukaemia and anaplastic large B- cell lymphoma. Refer to Table 1. The CD34 cell dose ($10^6/\text{kg}$), TNC dose ($10^8/\text{kg}$) and CD34 cell viability (%) on fresh and overnight stored samples showed no significant difference with p value of 0.98, 0.91 and 0.35 respectively ($p < 0.05$ is significant) with paired t-test. The culture for all these samples showed no growth.

NO.	AGE	SEX	DIAGNOSIS	CD 34 DOSE (X10 ⁶ /KG) IN FRESH SAMPLE	CD 34 DOSE (X10 ⁶ /KG) IN OVERNIGHT STORED SAMPLE	TNC DOSE (X10 ⁸ /KG) IN FRESH SAMPLE	TNC DOSE (X10 ⁸ /KG) IN OVERNIGHT STORED SAMPLE	CD34 VIABILITY % IN FRESH SAMPLE	CD34 VIABILITY % IN OVERNIGHT STORED SAMPLE
1	29	F	CHL	68.22	77.63	10.88	11.47	100	100
2	50	M	MCL	3.01	2.38	2.6	2	99.9	100
3	47	F	MM	3.71	3.03	1.05	0.92	99.7	98.5
4	53	M	MM	4.89	5.09	2.59	2.41	99.9	99.8
5	49	M	PTCL	6.54	7.83	2.79	2.96	99.8	98.9
6	35	F	CHL	9.16	9.40	7.11	7.25	100	100
7	41	M	Anaplastic LBCL	3.72	3.9	2.4	2.38	100	100
8	32	M	APML	5.86	5.49	5.51	5.79	100	100
9	20	F	HL	1.17	1.08	5.83	5.56	100	100
10	38	F	MM	2.06	2.17	2.05	2.08	99.3	99.9
11	51	M	MM	3.41	3.08	2.69	2.22	100	99.6
12	22	M	DLBCL	64.51	59.4	3.49	3.17	99.8	99.9
13	54	M	MM	3.2	3.03	2.7	2.78	99.7	99.8
14	27	F	CHL	5.57	5.38	3.75	3.68	100	100
15	43	M	MM	1.04	0.84	0.53	0.57	99.8	99.7
16	42	M	COMPOSITE LYMPHOMA	13.32	10.4	6.02	5.02	99.9	99.9
17	31	M	HL	5.18	5.29	2.64	2.68	99.9	100
18	54	M	DLBCL	28.7	31.2	2.39	2.33	99.9	99.8

Table 1: Demographic data with CD34 dose, TNC dose and CD34 viability %

Note: Multiple myeloma (MM), classical Hodgkin lymphoma (CHL), diffuse large B- cell lymphoma (DLBCL), mantle cell lymphoma (MCL), composite lymphoma, peripheral T-cell lymphoma (PTCL) and acute promyelocytic leukaemia (APML), anaplastic large B-cell lymphoma (LBCL), Hodgkin Lymphoma (HL), Total nucleated cells (TNC)

Summary/Conclusion:

This study verifies that no significant drop of stem cell count in overnight stored PBSC which is in keeping with our current practice and Malaysia's National Stem Cell Transplant guideline. In addition, there was no significant drop of TNC dose and CD34 viability %. Therefore, overnight storage can be considered in centers which receive large collection of stem cell harvests but has limited staffs to handle the processing (i.e. plasma depletion and cryopreservation) on the same of day of collection.

Keywords: CD34, Stem cell